

***Remarks***

Reconsideration of this Application respectfully is requested.

***Status of the Application and Claims***

Upon entry of the foregoing amendment, claims 1-26 are pending in the application, with claims 1 and 14 being the independent claims. Claims 3 and 16 are amended herein. No new matter has been entered.

***Summary of the Official Action***

In the Official Action, claims 1-26 were objected to as allegedly being informal ("not define" (sic)). Claims 1-12 and 14-25 were rejected under 35 U.S.C. 102(e), as allegedly being anticipated by U.S. Published Patent Application No. 2003/0086486 (Graziano), and claims 13 and 26 were rejected under 35 U.S.C. 103(a), as allegedly unpatentable over the Graziano '486 publication in view of Steele, SNR Formula for Linear Delta Modulation with Band-Limited Flat and RC-Shaped Gaussian Signals, IEEE Transactions on Communications, Vol. COM-28 (December 1977)(the Steele publication).

Reconsideration and withdrawal of the objection and rejections respectfully are requested in view of the above amendments and the following remarks.

***Formal Amendments to the Specification***

Initially, in a formal matter, the specification has been reviewed and amended to correct a number of inadvertent typographical errors and errors in grammar in paragraph nos. [0005], [0007],[0038], [0048] and [0060]. No new matter has been added. Favorable consideration and entry of the amendments respectfully are requested.

***Formal Amendments to the Claims***

Dependent claims 3 and 16 have been amended to improve their form; specifically, claims 3 and 16 have been amended to provide clear antecedent basis for features recited therein. Support for the amendments may be found in original claims 3 and 16 and the specification, e.g., at paragraph nos. [0034] - [0037]. No new matter has been added. Favorable consideration and entry of the amendments respectfully are requested.

***Rejections under 35 U.S.C. § 112***

The objection to claims 1-26 as allegedly informal respectfully is traversed. Initially, the objection is understood to be a formal rejection under 35 U.S.C. 112, second paragraph - that the claims allegedly are indefinite.

The objection to the term "m" as allegedly "not defined" (sic) respectfully is traversed. Applicants respectfully direct the Examiner's attention to paragraph [0006] of the specification as filed, which discloses that it is common practice to require that a communication system operate at a signal to noise ratio (SNR) exceeding a required signal to noise ratio ( $SNR_{req}$ ) - that is, an SNR that is necessary to achieve a bit error rate (BER) equal to a required bit error rate ( $BER_{req}$ ) - by some factor known in the art as noise margin ("referred to herein as 'm' "); the noise margin corresponds to an amount of noise increase that the communication system can tolerate while still insuring a data transport with a bit error rate (BER) lower than a required bit error rate ( $BER_{req}$ ); the specification further states that noise margin "m" may be calculated as:

$$m = SNR / SNR_{req}.$$

Accordingly, Applicants submit that the term "noise margin 'm' " is fully disclosed in a manner sufficient for one of ordinary skill in the art to make and use the invention as claimed, and that claim 1 (and likewise independent claim 14) satisfies all of the requirements of 35 U.S.C. 112, second paragraph. Reconsideration and withdrawal of the formal rejection respectfully are requested.

The objection to/rejection of claim 17 regarding the use of the term "performing" respectfully is traversed. Claim 17 is an apparatus claim and in several instances recites the feature of "means for performing a . . . measurement . . ." Support for these measurement features may be found in the specification , e.g., at paragraph nos. [0034] - [0037]. Reconsideration and withdrawal of the formal rejection respectfully are requested.

***Rejections under 35 U.S.C. § 102***

The rejection of claims 1-12 and 14-23 under 35 U.S.C. 102(e) respectfully is traversed. Independent claim 1 recites a method of optimizing operation of a communications system for receiving and processing an input communication signal to produce an output communication signal, comprising the steps of:

*selecting a first noise margin  $m$  relating to an external noise level present in the input communication signal;*

*selecting a second noise margin  $m_i$  relating to an internal noise level generated by the communications system;*

*calculating a virtual noise-to-signal ratio based on an external noise-to-signal ratio  $NSR_e$ , an internal noise-to-signal ratio  $NSR_i$ , said first noise margin, and said second noise margin; and*

*adjusting at least one operating parameter of the communications system to maintain said virtual noise-to-signal ratio at a predetermined margin above a required noise-to-signal ratio.*

The Graziano '486 publication fails to disclose or suggest at least the features of a first noise margin "m" and a second noise margin "m<sub>i</sub>," as disclosed in the present application and recited in claim 1. As noted above, the terms "m" and "m<sub>i</sub>" correspond to *selected* values relating to an external noise level and an internal noise level, respectively (see, e.g., paragraphs [0039] and [0040]); the values m and m<sub>i</sub> are selected in accordance with desired BER operation requisites of the communication system.

The Graziano '486 publication relates to a method and system for determining maximum power back off using frequency domain geometric signal to noise ratio (see title), and discloses a method and system for determining an absolute maximum power back off PBO that may be tolerated and still meet bit error rate BER (see abstract). However, Applicants submit that the Graziano '486 publication fails to disclose or suggest the above recited features of claim 1. With respect to the features of selecting first and second noise margins (m and m<sub>i</sub>), the portions of the Graziano '486 publication identified by the Examiner (Fig. 1b, boxes 126, 128) teach *measuring* a signal power (silent power spectrum and echo signal, respectively). With respect to the feature of calculating a *virtual* signal to noise ratio SNR<sub>v</sub>, the portion of the Graziano '486 publication identified by the Examiner (Fig. 1b, boxes 132; paragraph [0180] is understood merely to disclose calculating a *capacity* of the communication system - that is, the *maximum data rate* of the communication system - based on various factors including the silence power (noise), the received power (signal + noise), the signal to noise ratio SNR, a required margin in decibels (e.g., G.SHDSL Annex B margin of approximately 6 dB), and the like (see, also, paragraphs [0177] - [0181]). With respect to the "required margin in decibels," the Grazianon '486 publication is not understood to

disclose or suggest first and second margins for external and internal noise, respectively. And nowhere is the Graziano '486 publication understood to teach or suggest a method or system that utilizes a *virtual* SNR based, inter alia, on separate external and internal noise margins ( $m$  and  $m_i$ ). Nor is the Graziano '486 publication understood to disclose or suggest the feature of adjusting at least one operating parameter of the system to maintain the virtual noise to signal ratio at a predetermined margin above a required noise to signal ratio, as recited in the claims.

Independent claim 14 recites similar features with respect to an optimizing apparatus for a communication system. Applicants submit that the Graziano '486 publication fails to anticipate, teach or make obvious the features recited in claim 14 for at least the same reasons as claim 1.

Reconsideration and withdrawal of the rejection respectfully are requested.

***Rejections under 35 U.S.C. § 103***

The rejection of claims 13 and 26 under 35 U.S.C. 103(a) respectfully is traversed. Claims 13 and 26 depend from claims 1 and 14 respectively, and are believed allowable over the Graziano '486 publication for the same reasons.

Moreover, claims 13 and 26 recite the further features of setting (or means for setting) the second noise margin ( $m_i$ ), where  $m_i$  (and/or a formula for determining  $m_i$ ) varies based on the value of  $m$ , according to one of three ranges ( $m \leq 1.5$ ;  $1.5 \leq m \leq m_{\text{target}}$ ; and  $m_{\text{target}} \leq m$ ). Support for this feature may be found in the specification, e.g., at paragraph [0031].

In the official action, the Examiner acknowledges that the Graziano '486 publication fails to disclose the features recited in claims 13 and 26.

Applicants submit that the Steele publication fails to remedy the deficiencies of the Graziano '486 publication. The Steele publication is cited for its disclosure of a formula that gives an internal margin of 2 dB for an initial target margin, and as allegedly making obvious the feature to derive formula to calculate internal margin in dB. Without conceding the propriety of the Examiner's characterization of the Steele publication, Applicants submit that the Steele publication fails to disclose or suggest at least the above discussed features of claim 1 (and claim 14), let alone the above-discussed additional features of dependent claims 13 and 26.

***Summation***

For at least the above reasons, Applicants submit that independent claims 1 and 14 are allowable over the cited references, and are in condition for allowance.

Claims 2-13 and 15-26 depend from claims 1 and 14 and are believed allowable for the same reasons. Moreover, each of these dependent claims recite additional features in combination with the features of its respective base claim and is believed allowable in its own right. Individual consideration of the dependent claims respectively is requested.

***Conclusion***

Applicants believe that the present Amendment is responsive to each of the points raised by the Examiner in the Official Action, and submit that the application is in condition for allowance. Favorable consideration of the claims and passage to issue of the application at the Examiner's earliest convenience earnestly are solicited.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Respectfully submitted,

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